

[illegible]

## CLAIMS

Sub A17  
1. A translation loop modulator for a transmission circuit in a communication system, said translation loop modulator comprising:

input modulation means for receiving at least one input signal that is representative of information to be modulated, for receiving a feedback signal, and for producing an intermediate modulated signal responsive to said input signal and said feedback signal;

comparator means for receiving said intermediate modulated signal and a reference signal, and for producing an output transmission signal responsive to said intermediate modulated signal and said reference signal; and

feedback circuitry coupled to said output transmission signal, coupled to said reference signal and coupled to said input modulation means, said feedback circuitry for producing said feedback signal responsive to said output transmission signal and said reference signal.

2. A translation loop modulator as claimed in claim 1 further comprising a reference loop modulator for producing said reference signal.

3. A translation loop modulator as claimed in claim 2, wherein said reference loop modulator includes a fractional  $n$  synthesizer.

1 4. A translation loop modulator as claimed in claim 1, wherein said comparator means  
2 includes at least one frequency divider unit including an input port for receiving a first signal  
3 having a first frequency, and an output port for producing a second signal responsive to said  
4 first signal, said second signal having a second frequency of a predetermined relationship to  
5 the frequency of said first signal.  
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Sub A3  
1 5. A translation loop modulator as claimed in claim 4, wherein said input port of said  
2 frequency divider unit is coupled to said reference unit, and said output port of said frequency  
3 divider unit is coupled to a phase comparator device.  
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1 6. A translation loop modulator as claimed in claim 4, wherein said comparator means  
2 includes a second frequency divider unit including an input port for receiving a first signal  
3 having a first frequency, and an output port for producing a second signal responsive to said  
4 first signal, said second signal having a second frequency of a predetermined relationship to  
5 the frequency of said first signal.  
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Sub A3  
1 7. A translation loop modulator as claimed in claim 6, wherein said input port of said  
2 second frequency divider unit is coupled to said intermediate modulated signal, and said output  
3 port of said second frequency divider unit is coupled to a phase comparator device.  
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1 8. A translation loop modulator as claimed in claim 1, wherein said feedback circuitry  
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includes a mixer device including a first input port coupled to said output transmission signal, a second input port coupled to said reference signal, and an output port coupled to said feedback signal.

9. A translation loop modulator as claimed in claim 8, wherein said reference signal is directly connected to said mixer device.

10. A translation loop modulator for a transmission circuit in a communication system, said translation loop modulator comprising:

quadrature modulation means for receiving at least one input signal that is representative of information to be modulated, for receiving a feedback signal, and for producing an quadrature modulated signal responsive to said input signal and said feedback signal;

phase comparator means for receiving said quadrature modulated signal and a reference signal, and for producing a phase comparator signal responsive to said quadrature modulated signal and said reference signal;

oscillator means for receiving said phase comparator signal, and for producing an output transmission signal responsive to said phase comparator signal; and

feedback circuitry coupled to said output transmission signal, coupled to said reference signal and coupled to said quadrature modulation means, said feedback circuitry for producing said feedback signal responsive to said output transmission signal and said reference signal.

1 11. A translation loop modulator as claimed in claim 10 further comprising a reference loop  
2 modulator for producing said reference signal.

1 12. A translation loop modulator as claimed in claim 11, wherein said reference loop  
2 modulator includes a fractional  $n$  synthesizer.

1 13. A translation loop modulator as claimed in claim 10, wherein said comparator means  
2 includes at least one frequency divider unit including an input port for receiving a first signal  
3 having a first frequency, and an output port for producing a second signal responsive to said  
4 first signal, said second signal having a second frequency of a predetermined relationship to  
5 the frequency of said first signal.

sub 1 14. A translation loop modulator as claimed in claim 13, wherein said input port of said  
2 frequency divider unit is coupled to said reference unit, and said output port of said frequency  
3 divider unit is coupled to a phase comparator device.

1 15. A translation loop modulator as claimed in claim 13, wherein said comparator means  
2 includes a second frequency divider unit including an input port for receiving a first signal  
3 having a first frequency, and an output port for producing a second signal responsive to said  
4 first signal, said second signal having a second frequency of a predetermined relationship to  
5 the frequency of said first signal.

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1 16. A translation loop modulator as claimed in claim 15, wherein said input port of said  
2 second frequency divider unit is coupled to said intermediate modulated signal, and said output  
3 port of said second frequency divider unit is coupled to a phase comparator device.

1 17. A translation loop modulator as claimed in claim 10, wherein said feedback circuitry  
2 includes a mixer device including a first input port coupled to said output transmission signal,  
3 a second input port coupled to said reference signal, and an output port coupled to said  
4 feedback signal.

1 18. A translation loop modulator as claimed in claim 8, wherein said reference signal is  
2 directly connected to said mixer device.

1 19. A translation loop modulator for a transmission circuit in a communication system, said  
2 translation loop modulator comprising:

3 quadrature modulation means for receiving at least one input signal that is  
4 representative of information to be modulated, for receiving a feedback signal, and for  
5 producing an quadrature modulated signal responsive to said input signal and said feedback  
6 signal;

7 first frequency divider means for receiving said quadrature modulated signal, and for  
8 producing a first frequency divided signal responsive to said quadrature modulated signal;

9 second frequency divider means for receiving a reference signal, and for producing a

10 second frequency divided signal responsive to said reference signal;  
11 phase comparator means for receiving said first frequency divided signal and said  
12 second frequency divided signal, and for producing a phase comparator signal responsive to  
13 said first and second frequency divided signals;  
14 oscillator means for receiving said phase comparator signal, and for producing an  
15 output transmission signal responsive to said phase comparator signal; and  
16 feedback circuitry coupled to said output transmission signal, coupled to said reference  
17 signal and coupled to said quadrature modulation means, said feedback circuitry for producing  
18 said feedback signal responsive to said output transmission signal and said reference signal.

19 20. A translation loop modulator as claimed in claim 19 further comprising a reference loop  
20 modulator for producing said reference signal.

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